

Application No. 10/798,745
Response to Office Action

Customer No. 01933

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE SPECIFICATION

The specification has been amended to correct some minor informalities of which the undersigned has become aware. No new matter has been added, and it is respectfully requested that the amendments to the specification be approved and entered.

THE CLAIMS

Claim 1 has been amended to clarify the features of the present invention whereby the polygon mirror is bonded to a connection member that connects the polygon mirror to a bearing to support the polygon mirror about an axis of rotation thereof, and whereby the assembling reference surface has a rougher surface than the machining reference surface and is used as a reference surface for bonding the polygon mirror to the connection member with an adhesive. See the disclosure in the specification at, for example, page 11, lines 1-5 and 12-23, and see also Figs. 2, 5(a) and 5(b).

In addition, claim 5 has been amended to clarify the features of the present invention whereby the deflecting apparatus comprises a bearing that is rotatably mounted against

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the base member, whereby the connection member holds the polygon mirror and connects the polygon mirror to the bearing and is connected to the bearing to be rotatably mounted with the bearing about the base member, and whereby the assembling reference surface is rougher than the machining reference surface and is abutted against and bonded onto the connection member with an adhesive. See the disclosure in the specification at, for example, page 11, lines 1-5 and 12-23, and see also Figs. 2, 5(a) and 5(b).

Still further, claims 1-9 and 14 have been amended to make some minor grammatical improvements and to correct some minor antecedent basis problems so as to put them in better U.S. form.

Claims 15 and 16, moreover, have been added to depend from claims 1 and 5 to recite the feature of the present invention whereby the connection member transfers rotation torque to the polygon mirror, as supported by the disclosure in the specification at, for example, page 12, lines 12-17.

No new matter has been added, and it is respectfully requested that the amendments to claims 1-9 and 14 and the addition of new claims 15 and 16 be approved and entered.

THE PRIOR ART REJECTION

Claim 1 was rejected under 35 USC 102 as being anticipated by USP 5,373,391 ("Isobe et al"), and claim 5 was rejected under

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35 USC 103 as being obvious in view of Isobe et al. In addition, claims 2-4, 6-9 and 14 were rejected under 35 USC 103 as being obvious in view of the combination of Isobe et al and USP 5,692,287 ("Nakamura et al") or the combination of Isobe et al, Nakamura et al and USP 6,449,000 ("Suzuki"). These rejections, however, are respectfully traversed.

According to the present invention as recited in amended independent claims 1 and 5, a polygon mirror and a deflection apparatus including a polygon mirror are provided. According to amended independent claims 1 and 5, the polygon mirror comprises, in particular: a machining reference surface which is machined to have a mirror surface (or is planished, as recited in claim 5) and is used as a reference surface for machining the reflection surface on each of the circumferential surfaces; and an assembling reference surface which is parallel to the machining reference surface, and which rougher than the machining reference surface.

According to amended independent claims 1 and 5, the assembling reference surface is used as a reference surface for bonding the polygon mirror to the connection member with an adhesive. The connection member according to claims 1 and 5 connects the polygon mirror to a bearing to support the polygon mirror about an axis of rotation thereof.

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With this structure, when the polygon mirror is assembled into the deflecting apparatus, the assembling reference surface is bonded to the connection member and the adhesive spreads into the rough surface of the assembling reference surface, such that the assembling reference surface is firmly secured on the connection member (see page 11, lines 21-23). The polygon mirror is therefore highly reliable since it is not easily separated from the base structure of the deflection apparatus.

The Examiner asserts that the machining reference surface and assembling reference surface of the claimed present invention are present at the interface of yoke 2 and mirror surface formation member 3 at the top of mirror surface formation member 3 in Fig. 1 of Isobe et al. Specifically, the Examiner contends that the top surface of mirror surface formation member 3 contacting yoke 2 of Isobe et al corresponds to the machining reference surface of the present invention, and that the bottom surface of yoke 2 contacting mirror surface formation member 3 of Isobe et al corresponds to the assembling reference surface of the claimed present invention.

It is respectfully pointed out, however, that the "top surface of 3 where 2 sits on" of Isobe et al is not used as a reference surface for machining the reflection surface of the polygon mirror, in the manner of the machining reference surface as recited in claims 1 and 5.

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In addition, it is respectfully pointed out that according to Isobe et al the yokes 2 and 5 include respective wedge-shaped protrusions 2a and 5a to prevent yokes 2 and 5 from disengaging from the mirror surface formation member 3. Thus, according to Isobe et al the yokes 2 and 5 are secured by a structural connection.

By contrast, according to the present invention as recited in amended independent claims 1 and 5, the assembling reference surface is bonded to the connection member with an adhesive.

Still further, the Examiner contends that Isobe et al discloses that the top surface of the mirror formation member 3 contacting the yoke 2 is a mirror surface or planished, and that the bottom surface of yoke 2 contacting the mirror surface formation member 3 is rough.

It is respectfully pointed out that column 1, lines 63-66 of Isobe et al merely explains that the surface of the yoke 2 must be subjected to a secondary machining operation to obtain "strict planeness and surface roughness." This section of Isobe et al does not mention the surface of the mirror surface formation member 3, despite the Examiner's assertion that the reference to "planeness" refers to the surface of the mirror surface formation member 3.

In addition, it is respectfully pointed out that "strict planeness and surface roughness" is an integral phrase by which

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Isobe et al explains that the surface of the yoke 2 contacting the mirror surface formation member 3 must be very smooth. Indeed, Isobe et al states at column 4, lines 1-5 that the surfaces of the yokes 2 and 5 in contact with the mirror surface formation member 3 require a highly accurate finish in the prior art. Since column 1, lines 63-66 of Isobe et al describes the yokes 2 and 5 of the prior art of Isobe et al, it is respectfully pointed out that column 1, lines 63-66 clearly does not describe a rough surface for the yoke 2.

With respect to claim 5, moreover, the Examiner asserts that thrust plate 11 in Fig. 3 of Isobe et al corresponds to the flange (connection) member recited in claim 5.

It is respectfully pointed out, however, that the thrust plate 11 of Isobe et al is fixedly secured to the supporting shaft 8 and makes up the thrust bearing together with the ceramic ring 1.

By contrast, according to the present invention as recited in amended independent claims 1 and 5, the connection member is bonded to the polygon mirror, and as recited in new claims 15 and 16, the connection member transfers rotation torque to the polygon mirror.

In view of the foregoing, it is respectfully submitted that the present invention as recited in amended independent claims 1 and 5, and claims 2-4, 6-9 and 14-16 respectively depending

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therefrom, clearly patentably distinguishes over Isobe et al,
taken singly or in any combination with Nakamura et al and
Suzuki, under 35 USC 102 as well as under 35 USC 103.

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Entry of this Amendment, allowance of the claims and the
passing of this application to issue are respectfully solicited

If the Examiner has any comments, questions, objections or
recommendations, the Examiner is invited to telephone the
undersigned for prompt action.

Respectfully submitted,


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